

Claims

- [c1] A power generation plant comprising a power generating unit comprising at least one first generator coupled to at least one synchronous generator having a rotor with a superconducting coil, the first generator and the synchronous generator being coupled so that the synchronous generator supplies the first generator with reactive power.
- [c2] A power generation plant according to claim 1, wherein the synchronous generator supplies the first generator with sufficient reactive power to meet the VAR requirements of the first generator.
- [c3] A power generation plant according to claim 1, wherein the first generator is an induction generator.
- [c4] A power generation plant according to claim 3, wherein the induction generator is operable at non-constant speeds.
- [c5] A power generation plant according to claim 3, wherein the unit comprises means for operating the induction generator at variable speeds to support grid stability during system transients.

- [c6] A power generation plant according to claim 3, wherein the unit comprises means for operating the induction generator at variable speeds in response to short-term system overloads.
- [c7] A power generation plant according to claim 1, wherein the power generating unit comprises at least two first generators coupled to a single synchronous generator.
- [c8] A power generation plant according to claim 1, wherein the hybrid power generation plant comprises more than one of the power generating unit.
- [c9] A power generation plant according to claim 1, wherein the first generator produces three-phase alternating current.
- [c10] A power generation plant connected to a distribution network, the power generation plant comprising a power generating unit that comprises turbines, at least two induction generators, and at least one synchronous generator, each of the turbines driving a rotor of a corresponding one of the synchronous and induction generators, the rotor of the synchronous generator comprising a high-temperature superconducting coil at a temperature sufficient to achieve a superconducting state therein, the induction generators and the synchronous

generator being coupled so that the synchronous generator supplies each of the induction generators with sufficient reactive power to meet the VAR requirements of the induction generators.

[c11] A power generation plant according to claim 10, wherein each of the induction generators are operable at non-constant speeds.

[c12] A power generation plant according to claim 10, wherein the unit comprises means for operating the induction generators at variable speeds to support grid stability during system transients.

[c13] A power generation plant according to claim 10, wherein the unit comprises means for operating the induction generators at variable speeds in response to short-term system overloads.